

It is an object of this invention to propose a new X-ray tube and a corresponding method of production of such an X-ray tube not having the drawbacks described above. In particular, an X-ray device should be proposed allowing electric powers several times higher than conventional X-ray devices.

5 The tubes should also be able to be constructed modularly, and be produced simply and economically. Furthermore any possible defective parts of the X-ray tube should be replaceable without the whole X-ray tube having to be replaced.

This object is achieved according to the present invention in particular through the elements of the independent claims. Further

10 advantageous embodiments follow moreover from the dependent claims and from the specification.

These objects are achieved in particular through the invention in that an anode and a cathode are disposed opposite each other in a vacuumized inner space in an X-ray tube, electrons  $e^-$  being produced at the cathode, being

15 accelerated to the anode by means of impressible high voltage, and X rays  $\gamma$  being produced at the anode by means of the electrons  $e^-$ , the X-ray tube comprising a multiplicity of mutually complementary acceleration modules, which acceleration modules each comprise at least one potential-carrying electrode, and which acceleration modules are replaceable, the first

20 acceleration module comprising the cathode with primary electron generation ( $e^-$ ), the last acceleration module comprising the anode with the X-ray generation ( $\gamma$ ), and the X-ray tube comprising at least one further acceleration module with a potential-carrying electrode. The anode can comprise a target for X-ray generation with an emission hole, or can be designed as a

25 transmission anode, in the case of the transmission anode the vacuumized inner space of the X-ray tube being closed off toward the outside. At least one of the electrodes can comprise spherical or conical ends for reducing or minimizing the field peak at the respective electrode. The electrodes can be connected, for example, with a high voltage cascade, e.g. by means of voltage

30 connections. One advantage, among others, of the invention is that very high

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power X-radiation can be generated, the overall geometric size of the X-ray tube being small, in particular compared with tubes of the state of the art, and at the same time the invention makes possible an X-ray tube which is able to be operated in a stable manner over a very broad electrical voltage

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**AMENDED PAGE (April 7, 2005)**